

Menominee River Bridge
(Chalk Hill Bridge)
Spanning the Menominee River at CTH "K"
Town of Amberg
Marinette County
Wisconsin

HAER No. WI-80

HAER
WIS
38-AMB.V,
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

**HISTORIC AMERICAN ENGINEERING RECORD
MENOMINEE RIVER BRIDGE (Chalk Hill Bridge)
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Note: The Menominee River Bridge (Chalk Hill Bridge) is located in both Marinette County, Wisconsin, and Menominee County, Michigan. However, for shelving purposes at the Library of Congress, Marinette County, Wisconsin, was selected as the "official" location for the Menominee River Bridge (Chalk Hill Bridge).

Location:	Spanning the Menominee River at County Trunk Highway "K" between the town of Amberg, Marinette County, Wisconsin, and the town of Holmes, Menominee County, Michigan
Quad:	Miscauno Island, Wis.-Mich.
UTM:	16:5039930:437370 16:5039970:437450
Date of Construction:	1927
Present Owners:	Marinette County, Wisconsin and Menominee County, Michigan
Present Use:	Vehicular and pedestrian bridge. Scheduled to be replaced in 1997.
Significance:	The Menominee River Bridge is a contributing resource to the Chalk Hill Hydroelectric Historic District, which has been determined eligible for the National Register of Historic Places. The six-span concrete deck girder structure was built using Wisconsin Highway Commission standard plans; the bridge railing was designed to match the architectural style of the nearby power plant.
Historians:	Amy R. Squitieri and Kirk R. Huffaker, Mead & Hunt, Inc., Madison, Wisconsin, October 1995.

I. LOCATION

The Menominee River Bridge carries County Trunk Highway "K" across the Menominee River between Marinette County, Wisconsin, and Menominee County, Michigan, at a point approximately 55 miles upstream from the river's outlet into Green Bay.¹ The site is 20 miles east of Amberg, Wisconsin. Crossing the river on a tangent, the bridge reorients County Trunk Highway "K" from a southwest-northeast alignment in the town of Amberg, Wisconsin, on the west bank of the river, to directly east in the town of Holmes, Michigan, on the east bank.

II. HISTORICAL BACKGROUND

Designed by the State Highway Commission (SHC), the Menominee River Bridge was built as part of the 1926-27 Chalk Hill hydroelectric project construction. The contractor for the Chalk Hill hydroelectric facility was Sieme, Helmers & Schaffner, Inc., of St. Paul, Minnesota. The bridge was built from SHC standard plans at an estimated cost of \$40,950.

The Menominee River Bridge is a contributing resource within the Chalk Hill Hydroelectric Historic District, which also includes a contributing powerhouse, spillway and gates, and earth dike. Northern Electric Company of Wisconsin, owners of the property during construction, specifically erected the powerhouse facility to supply operating power to the Northern Paper Mills in Green Bay. The plant was engineered to generate maximum usage of the Menominee River. The bridge was built solely to provide access to the power plant located approximately 500 feet to its north. Forested

¹ The Menominee River Bridge has been issued Wisconsin Department of Transportation identification number B-38-916. A number is given to each bridge located on the state highway system in Wisconsin.

hills surrounding the Chalk Hill Historic District contain recreation areas, camps, and part of the Escanaba River State Forest of Michigan.

Records indicate that this bridge was the first crossing established over the Menominee River at this location. However, a concrete footing was found on the east shore of the river approximately 200 feet south of the Menominee River Bridge, showing evidence of a possible earlier crossing.²

III. HISTORICAL SIGNIFICANCE

The Chalk Hill site was originally approved for hydroelectric use in 1922 by the Railroad Commission when the White Rapids Paper Company owned the land. Two years later, White Rapids Paper Company transferred all land and water rights to Northern Paper Mills, which, in turn, transferred the rights to Northern Electric Company in 1926. For engineering and economic reasons, the Chalk Hill project was constructed in conjunction with the White Rapids hydroelectric facility located less than 3 miles downstream.

Construction first began at the Chalk Hill site in the fall of 1926, while work began at White Rapids the following May. While working at White Rapids, a crew was also employed in building the last resource of the Chalk Hill hydrofacility, the Menominee River Bridge. Chalk Hill's property rights were transferred back to Northern Paper Mills in 1937, and that same year, the facility was bought

² Though this footing was located, an earlier bridge construction could not be discovered through historical records, as the bridge does not appear on historic maps of 1896 or 1912; see bibliography.

by the Wisconsin Michigan Power Company.³ The present owner of the hydroelectric facility is the Wisconsin Electric Power Company (WEPCO), which obtained ownership sometime after 1977, when WEPCO split from the Wisconsin Michigan Power Company.⁴

IV. THE WISCONSIN STATE HIGHWAY COMMISSION

The role of the state of Wisconsin in highway and bridge development dramatically increased at the turn-of-the-century. The growing popularity and availability of the automobile coincided with the increased demand for better roads and bridges and eventually led to the development and standardization of highways.

In 1908, Wisconsin voters eliminated the state's constitutional proscription against direct state aid to transportation projects, which had been the greatest obstacle to creating a standardized system of bridges and highways statewide. The State Constitution had been amended six times since its inception to exact changes in transportation law, with each amendment weening local governments and counties from the responsibility of selecting, building, funding, and maintaining bridges. At the same time, these amendments provided for more state funding and governmental control.⁵

³ Linda Brazeau, Chalk Hill Hydroelectric Facility National Register of Historic Places Nomination, (State Historical Society of Wisconsin, Division of Historic Preservation, Madison, Wisc., 1991) Section 8.

⁴ Brazeau, Section 8. The Wisconsin Michigan Power Company was formed by the reorganization and consolidation of smaller companies in 1927.

⁵ Ballard C. Campbell, "The Good Roads Movement in Wisconsin, 1890-1911," Wisconsin Magazine of History 49.4 (1966): 273-293; Robert Nesbit, The History of Wisconsin: Volume III, Urbanization and Industrialization (Madison, Wisc.: Univ. of Wisconsin Press, 1985) 139-147.

The Highway Division, an experimental body of the Wisconsin Geological and Natural History Survey founded in 1897, was restructured by the state legislature in 1911. The new State Highway Commission (SHC) had responsibility for the development of a publicly funded state highway network.⁶ The SHC filled a technical and engineering void that previously existed when county and town officials were willing to budget for bridge construction but did not have the expertise to select the appropriate bridge type for their situation. The SHC also worked to repair or replace potentially hazardous bridges of poor design, lightweight construction, and inadequate maintenance.⁷ For new bridges and culverts, the SHC emphasized the use of standardized plans of various types.⁸

Practically all local bridges built in the state during the 1920s were either designed by the SHC or were based on standard SHC plans.⁹ In 1926, despite its enthusiastic support for concrete construction, the SHC declared that the steel bridge "is not looked upon with disfavor" and continued to refine its truss designs. Both monumental and modest newly designed SHC truss bridges continued to be featured in the photographic sections of the agency's biennial reports. Nevertheless,

⁶ Campbell 279-284; M.G. Davis, A History of Wisconsin Highway Development, 1835-1945, (Madison, Wisc.: Wisconsin Department of Transportation, 1945) 104.

⁷ Jeffrey A. Hess and Robert M. Frame III, Wisconsin Stone-Arch and Concrete-Arch Bridges, Vol. I, (Madison, Wisc.: Wisconsin Department of Transportation, 1986) 235, 239, 243-245.

⁸ Campbell 278-279.

⁹ Davis 112-113; Wisconsin State Highway Commission, Second Biennial Report 21, 14, 30; see also Wisconsin State Highway Commission, Preliminary Biennial Report...1911 to 1913, (Madison, Wisc.: published by the State, 1913) 17.

the SHC clearly favored concrete spans, citing advantages of lower cost, greater adaptability for remodeling—especially in widening roads—and greater compatibility with aesthetic treatment.¹⁰

Concrete and steel became the most important materials in modern bridge construction. Plain concrete proved to have the same structural properties as stone, but concrete did not have to be cut to exact size and could be formed from its liquid state into the proper shape. Reinforced concrete, composed of steel surrounded by a protective layer of concrete, allowed the strength of steel to be combined with the added protection and strength of concrete. Reinforced concrete could be used in a myriad of structural forms, with spans ranging from a few feet to 600 feet.¹¹ These new bridge designs produced by these materials included the reinforced concrete suspension bridge, the arched concrete bridge, and the reinforced concrete girder bridge.

VI. ENGINEERING DESCRIPTION

The Menominee River Bridge is a reinforced concrete deck girder with six spans measuring 327'-0" in total length. Each span is of equal length at approximately 54'-0". The bridge has a roadway width of 21'-0" with 3'-4"-wide sidewalks on each side. The bridge surface includes an asphalt-covered concrete deck that carries the roadway.

¹⁰ Wisconsin State Highway Commission, Sixth Biennial Report, 1925-1926 (Madison, Wisc.: published by the State, 1926) 67. From 1911 to 1915, truss bridges cost considerably less per foot than concrete structures, but then steel began its "great advantage in price"; see Wisconsin State Highway Commission, Fourth Biennial Report 1916-1918, (Madison, Wisc.: published by the State, 1918) 11-12.

¹¹ Synthesized from Charles S. Whitney, Bridges: Their Art, Science and Evolution, ([1929] New York, NY: Greenwich House, 1983).

When the bridge was designed, the SHC requested that its railing emulate the architectural style of the nearby power plant, which resulted in the bridge's Gothic Revival character. On each of the six spans, the railing is divided into three sections by two small concrete pedestals. The railing and smaller pedestals are capped with concrete. Each of the three sections features nine openings measuring 1'-0" wide and 2'-0" tall. Larger ornamented concrete pedestals terminate each span at the piers and abutments. The larger concrete pedestals are each adorned with a recessed tripartite gothic arch and are capped with a trapezoidal slab of concrete. Decorative light fixtures, now missing their lanterns, are mounted with flared bases on these larger pedestals.

Six reinforced concrete stringers support the deck of each span. The stringers are connected at the abutment walls and piers with bearings. Between the abutments are five reinforced concrete piers with recessed center panels and pointed buttress ends. The abutments are full retaining type, while the piers are solid shaft type. Wing walls extend from each abutment wall. The outside stringers, piers, abutments, and the wing walls are all capped with concrete.

The ornamentation of the bridge rail and hydroelectric plant stands as an example of the application of the Gothic Revival style of architecture to industrial structures. The Gothic Revival style of the hydroelectric plant is established by the repetitive rhythm of its buttressed pilasters and the use of stained glass, especially in the massive, arched, tripartite, polychromatic window on the west facade. The powerhouse displays three sets of triple-arched windows separated by wide brick sections and terminated at the edges with brick pilasters on the south facade. Each bridge span echoes this pattern, with three sections of nine arched openings separated by concrete pedestals and terminated

at the ends with larger pedestals. The terminating pedestals further echo the sets of three on the hydroelectric plant and bridge rail with a recessed tripartite gothic arch.

VII. CONCLUSION

Since its construction in 1927, the Menominee River Bridge has been altered only by a resurfacing of the original concrete deck with asphalt. However, the Menominee River bridge's condition has slowly deteriorated. Currently, the bridge provides only 50 percent of the capacity required by current standards and is scheduled for replacement. The Menominee River Bridge is a contributing resource of the Chalk Hill Historic District, which has been determined eligible for the National Register of Historic Places. The bridge is a fine example of a standard SHC bridge designed in a sympathetic architectural style to match its counterpart, the Chalk Hill hydroelectric plant.

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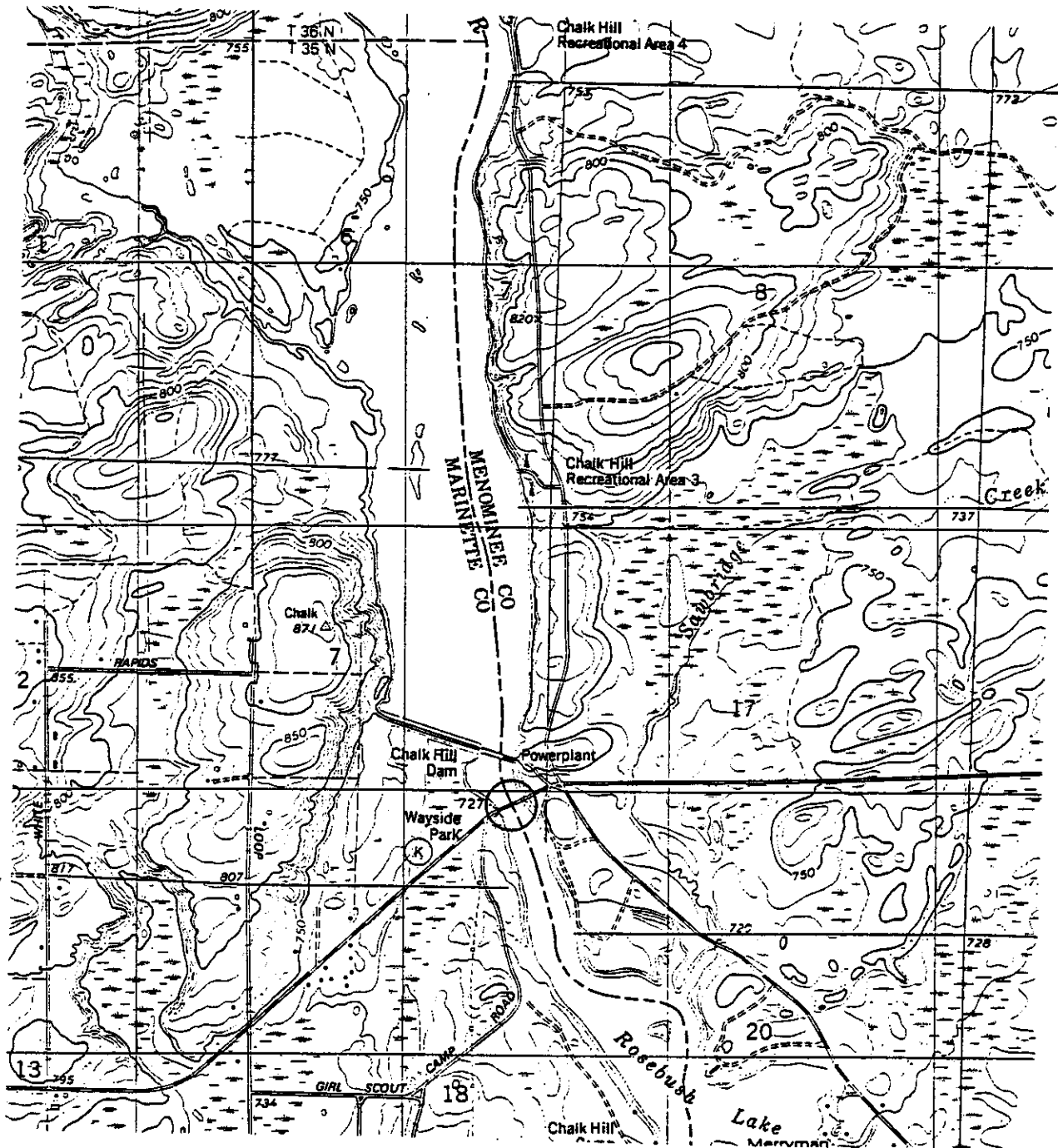


Figure 1: USGS Quad: Miscoano Island, Wisconsin-Michigan
(7.5 minute series)

west end: 16:5039930:437370

east end: 16:5039970:437450

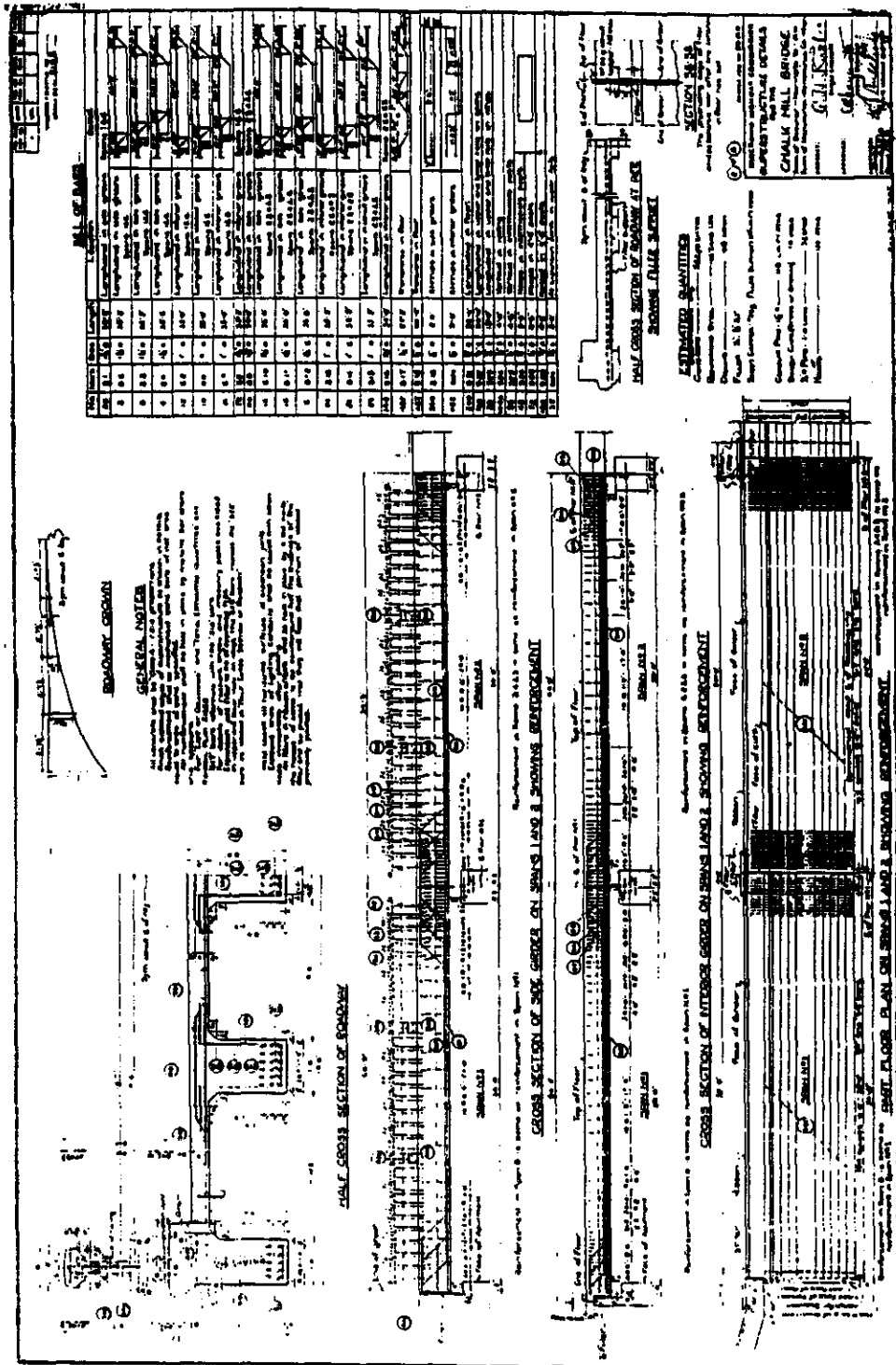


Figure 2: Wisconsin State Highway Commission, "Superstructure Details for the Chalk Hill Bridge", X1683.

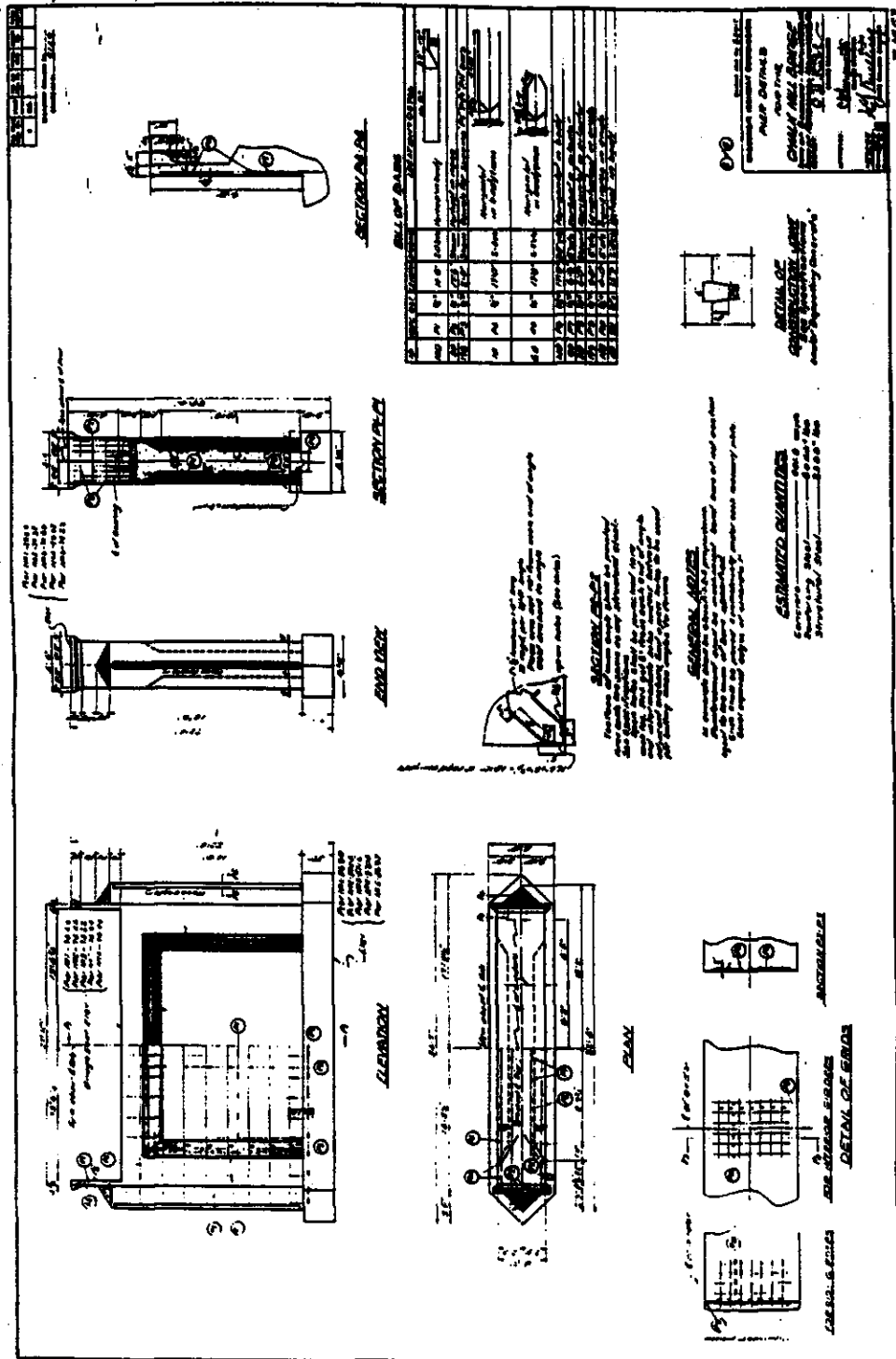


Figure 3: Wisconsin State Highway Commission, "Pier Details for the Chalk Hill Bridge", X1667.